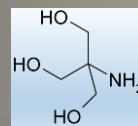


Crystal packing of diorganotin complexes with TRIS ligands

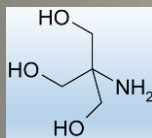
Lee See Mun
Research Center for Crystalline Materials (RCCM)
Sunway University

TRIS



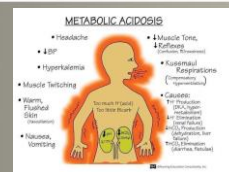
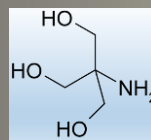
- ❖ Tris(hydroxymethyl)aminomethane
- ❖ IUPAC name: 2-Amino-2-hydroxymethyl-propane-1,3-diol
- ❖ Primary amine, 3 hydroxy groups

TRIS



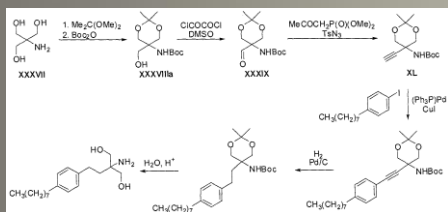
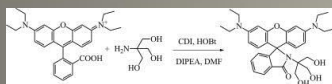
- ❖ Component of buffer solutions;
- ❖ pKa ~ 8.1 at 25°C, effective at pH 7-9
- ❖ Inexpensive, robust than more specialized buffers

TRIS

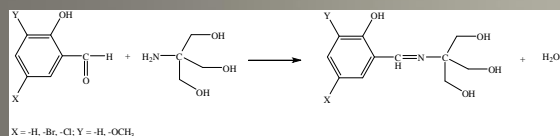


- ❖ Primary standard to standardize acid solutions for chemical analysis
- ❖ used as alternative to sodium bicarbonate in the treatment of metabolic acidosis

TRIS



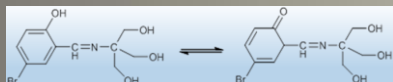
TRIS LIGAND



X = -H, -Br, -Cl; Y = -H, -OCH₃

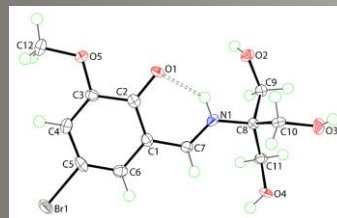
TRIS LIGAND

Keto-enol form



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TRIS LIGAND



4-Bromo-6-methoxy-2-
[[tris(hydroxymethyl)methyl]iminium]phenolate

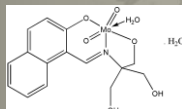
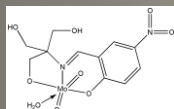
S. M. Lee, K. M. Lo, S. L. Tan & Edward, R. T. Tiekink, Acta Cryst (2016), E72, 1223-1227

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Literature Review

Yan, S. *et al.* (2007) [*J. Molecular Catalysis A*] :

- ❖ reported synthesis & X-ray structures of ligands & dioxomolybdenum(VI) complexes
- ❖ catalytic applications of complexes in epoxidation of cyclohexane with *tert*-butyl hydroperoxide (TBHP)
- ❖ configuration distorted octahedral,
1 coordinating water, 1 phenoxy oxygen, 1 methoxy oxygen

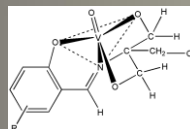


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Literature Review

Asgebom, G. *et al.* (1995) [*Polyhedron*] :

- ❖ reported synthesis & characterization of ligands & oxovanadium(V) complexes
- ❖ evidence based on electrochemical studies & FTIR studies



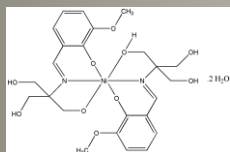
where R = H, 3-OMe, 5-Me, 5-OH, 5,6-Benzo

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Literature Review

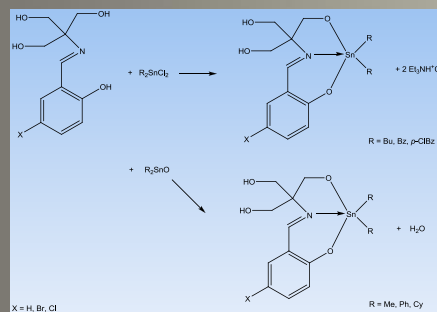
Zhou, T. *et al.* (2009) [*Acta Cryst E.*]

- ❖ crystal structure of *bis*(6-methoxy-2-[[tris(hydroxymethyl)methyl-O]iminomethyl]phenolato-*N,O*)nickel(II) dehydrate
- ❖ octahedral Ni with 6-coordinated by 4 oxygens & 2 nitrogens



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TRIS COMPLEXES

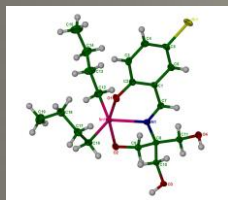


X = H, Br, Cl

R = Me, Ph, Cy

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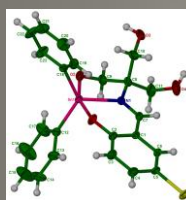
TRIS COMPLEXES



(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-bromophenolato)dibutyltin(IV), TB2

13

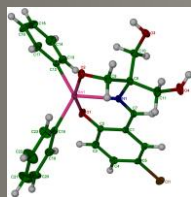
TRIS COMPLEXES



(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-bromophenolato)diphenyltin(IV), TB3

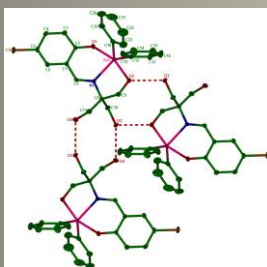
14

TRIS COMPLEXES

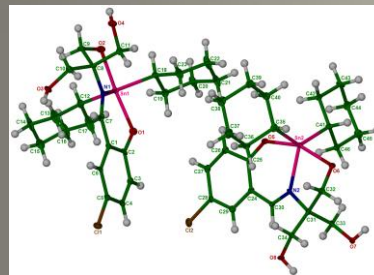


(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-chlorophenolato)diphenyltin(IV), TC3

15



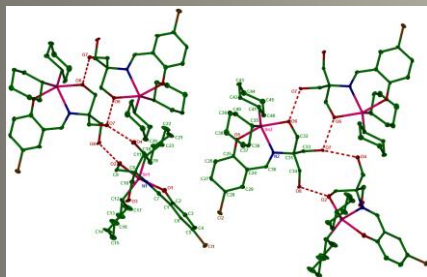
TRIS COMPLEXES



(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-chlorophenolato)dicyclohexyltin(IV), TC4

16

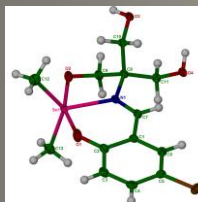
TRIS COMPLEXES



(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-chlorophenolato)dicyclohexyltin(IV), TC4

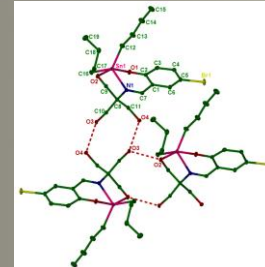
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TRIS COMPLEXES

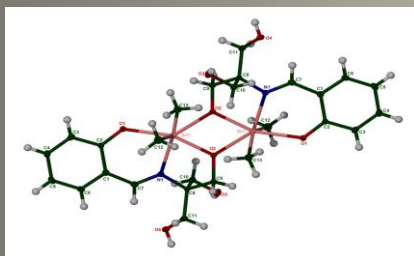


(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-chlorophenolato)dimethyltin(IV), TC1

18



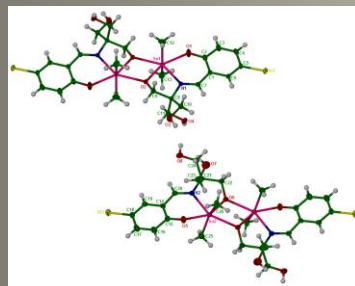
TRIS COMPLEXES



bis[(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]phenolato)]dimethyltin(IV), TA1

19

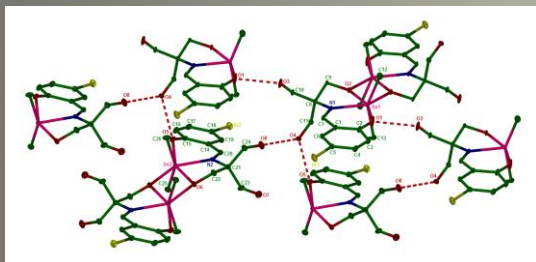
TRIS COMPLEXES



bis[(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-bromophenolato)]dimethyltin(IV), TB1

20

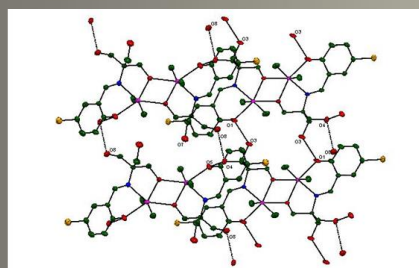
TRIS COMPLEXES



bis[(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-bromophenolato)]dimethyltin(IV), TB1

21

TRIS COMPLEXES

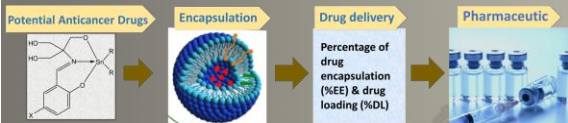


bis[(2-[[1,1-bis(hydroxymethyl)-2-oxidoethyl]iminomethyl]-4-bromophenolato)]dimethyltin(IV), TB1

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TRIS Complexes

Future works....



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The 29th Malaysian Analytical Chemistry Symposium
Bayview Beach Resort, Penang, Malaysia
15-17 August 2016



Thank
you

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